Claims

[c1]
1. A energy-consumption predicting system comprising:

means for measuring amounts of energy consumed by at least one of energy-consuming site and energy-consuming systems;

means for determining information regarding an operation of said at least one of energy-consuming site and energy-consuming systems;

means for transmitting said amounts and said information to a means for receiving said amounts and said information;

means for analyzing and evaluating said amounts and said information to provide analyzed and evaluated data and information;

means for generating predicted amounts of energy required for the operation of said at least one of energy-consuming site and energy-consuming systems; and

means for providing access to said analyzed and evaluated data and information and said predicted required amounts of energy.

[c2]
2. The system according to claim 1, wherein in the at least one energy-consuming site comprises at least one energy-consuming system.

[c3]
3. The system according to claim 2, wherein the at least one energy-consuming system comprises a plurality of energy-consuming systems.

[c4]
4. The system according to claim 1, wherein the at least one energy-consuming site comprises a plurality of energy-consuming sites.

[c5]
5. The system according to claim 1, wherein the energy comprises at least one selected from the group consisting of electricity, natural gas, diesel fuel, gasoline, fuel oil, coal, and combinations thereof.

[c6]
6. The system according to claim 1, wherein the means for measuring amounts of energy consumed comprises at least one meter for each type of energy consumed.

[c7]
7. The system according to claim 6, wherein the at least one meter comprises a meter selected from the group consisting of digital meters, analog meters, mechanical meters, broad-band spectrum modems, process logic control meters, and combinations thereof.

[c8]
8. The system according to claim 6, wherein the at least one meter comprises a meter disposed in cooperation with at least one delivery line that delivers energy to the energy-

consuming site.

[c9]   9.The system according to claim 8, wherein the meter that is disposed in cooperation with the at least one delivery line comprises a meter disposed prior to the energy-consuming site in a position sufficient to measure total energy amounts delivered to the energy-consuming site.

[c10]   10.The system according to claim 9, wherein the energy is delivered by a method selected from the group consisting of pipeline, electrical line, delivery vehicles, and combinations thereof.

[c11]   11.The system according to claim 9, wherein the meter is disposed in cooperation with the at least one delivery line comprises a meter disposed prior to each energy-consuming system in the energy-consuming site in a position sufficient to measure energy delivered to each energy-consuming system at the energy-consuming site.

[c12]   12.The system according to claim 1, further comprising communications links between each of the means for measuring, the means for determining, the means for transmitting, the means for receiving, the means for analyzing and evaluating, the means for generating, and the means for providing.

[c13]   13.The system according to claim 12, wherein the communications link is selected from the group consisting of phone modem, network connection, communication, radio communication and other wireless communication systems, cellular communication, satellite communication, web access communication, Internet access communication, Intranet access communication, and combinations thereof.

[c14]   14.The system according to claim 1, wherein the means for analyzing and evaluating the energy amounts consumed and the information comprises at least one data processing module.

[c15]   15.The system according to claim 1, wherein the means for analyzing and evaluating the energy amounts consumed and the information and the means for generating predicted amounts of energy comprise a data processing module.

[c16]   16.The system according to claim 1, wherein the means for analyzing and evaluating the energy amounts consumed and the information comprises means for providing energy-provider information for evaluation and analysis.

[c17]   17. The system according to claim 16, wherein the energy-provider information is provided as real-time information.

[c18]   18. The system according to claim 17, wherein the energy-provider information is provided in electronic form.

[c19]   19. The system according to claim 18, wherein the energy-provider information comprises at least one of energy unit prices, delivery tariffs, energy taxes, and combinations thereof.

[c20]   20. The system according to claim 1, wherein the means for analyzing and evaluating the energy amounts consumed and the information comprises means for providing energy delivery information for evaluation and analysis.

[c21]   21. The system according to claim 20, wherein the means for providing energy delivery information for evaluation and analysis comprises means for providing information on at least one of delivery routes, delivery costs, loss costs, tariffs, taxes, transportation costs, and combinations thereof.

[c22]   22. The system according to claim 1, wherein the means for measuring energy amounts consumed at the energy-consuming site and the means for analyzing and evaluating the energy amounts consumed and the information comprise a computer.

[c23]   23. The system according to claim 1, further comprising a means for providing process variable information to the means for analyzing and evaluating the energy amounts consumed and the information.

[c24]   24. The system according to claim 23, wherein the means for providing process variable information provides at least one of time, date, temperature, humidity, energy-consuming site location, and other process-influencing variables for the energy-consuming site.

[c25]   25. The system according to claim 23, further comprising means for providing raw material data and information to the means for analyzing and evaluating the energy amounts consumed and the information.

[c26]   26. The system according to claim 23, further comprising means for providing by-product and waste information to the means for analyzing and evaluating the energy amounts consumed and the information.

[c27]   27. The system according to claim 23, further comprising means for providing product

information to the means for analyzing and evaluating the energy amounts consumed and the information.

[c28]   28.The system according to claim 1, wherein the means for analyzing and evaluating the energy amounts consumed and the information comprises at least a means selected from the group consisting of means for acquiring data, means for mining data, and means for analyzing data.

[c29]   29.The system according to claim 28, wherein each of the means for acquiring data, means for mining data, and means for analyzing data comprises data acquisition software, data mining software, data analysis software, and combinations thereof.

[c30]   30.The system according to claim 1, wherein the means for analyzing and evaluating the energy amounts consumed and the information comprises at least one means selected from the group consisting of means for purchasing energy, means for predicting energy use trends, means for planning energy-related decisions, means for purchasing energy, means for predicting energy price trends, and combinations thereof.

[c31]   31.The system according to claim 30, wherein the means for purchasing energy, means for predicting energy use trends, means for planning energy-related decisions, means for purchasing energy, means for predicting energy use trends, means for predicting energy price trends, and combinations thereof comprises software.

[c32]   32.The system according to claim 1, further comprising a web site that is connected to the means for analyzing and evaluating to communicate energy-related information and permits access to the analyzed and evaluated data and information and the predicted amounts of energy required for said operation.

[c33]   33.The system according to claim 32, wherein the web site permits a user interaction with at least one of the means for measuring, the means for determining, the means for transmitting, the means for analyzing and evaluating, the means for generating, and the means for providing.

[c34]   34.The system according to claim 33, wherein the web site provides real-time analyzed and evaluated data and information and predicted required amounts of energy.

[c35]   35.The system according to claim 34, wherein the means for measuring energy amounts delivered comprises at least one meter, the web site is connected to each meter of the

means for measuring, and the web site permits access to meter information.

[c36]   36.The system according to claim 34, wherein the means for analyzing and evaluating the energy amounts consumed and the information comprises at least one data processing module, the web site is connected to each meter of the means for measuring, and the web site permits access to the at least one data processing module.

[c37]   37.The system according to claim 34, wherein the means for analyzing and evaluating the energy amounts consumed and the information comprises means to provide information on energy consumption for evaluation and analysis, the web site is connected to each meter of the means for measuring, and the web site permits access to the information on energy consumption.

[c38]   38.The system according to claim 1, wherein the means for analyzing and evaluating the energy amounts consumed and the information comprises planning tools that can be used to plan at least one of future times for operation of energy-consuming systems at the energy-consuming site, future times to purchase energy, and future amounts of energy that should be purchased, as determined by the energy-consumption predicting system.

[c39]   39.The system according to claim 28, wherein the means for analyzing and evaluating comprises a user interface that allows a user to relate data on amounts of energy consumed to other variables of the energy-consuming site.

[c40]   40.The system according to claim 1, wherein the means for generating predicted amounts of energy required comprises software that provides a construction of a transfer function for energy consumption of the energy-consuming site.

[c41]   41.The system according to claim 40, wherein the transfer function is a regression of energy consumption on other variables of the energy-consuming site.

[c42]

42.An energy-consumption predicting method comprising the steps of:
measuring amounts of energy consumed by at least one of energy-consuming site and energy-consuming systems;
determining information regarding an operation of said at least one of energy-consuming site and energy-consuming systems;
transmitting said amounts and said information to a means for receiving said amounts and said information;

analyzing and evaluating said amounts and said information to provide analyzed and evaluated data and information;

generating predicted amounts of energy required for the operation of said at least one of energy-consuming site and energy-consuming systems; and

providing access to said analyzed and evaluated data and information and said predicted required amounts of energy.

[c43]   43. The method according to claim 42, wherein the step of measuring the energy amounts comprises a step of measuring energy delivered to at least one energy-consuming system.

[c44]   44. The method according to claim 42, wherein the step of determining the energy amounts comprises a step of measuring energy from a plurality of energy-consuming systems and a plurality of energy-consuming systems.

[c45]   45. The method according to claim 42, wherein the step of measuring the energy amounts comprises measuring the amounts of at least one selected from the group consisting of electricity, natural gas, diesel fuel, gasoline, fuel oil, coal, and combinations thereof.

[c46]   46. The method according to claim 42, wherein the step of measuring amounts of energy comprises measuring energy by metering the energy.

[c47]   47. The method according to claim 46, wherein the step of metering comprises metering the energy amounts using a meter selected from the group consisting of digital meters, analog meters, mechanical meters, broad-band spectrum modems, process logic control meters, and combinations thereof.

[c48]   48. The method according to claim 46, wherein the step of metering comprises disposing at least one meter on at least one delivery line that delivers energy to the energy-consuming site.

[c49]   49. The method according to claim 48, wherein the step of disposing at least one meter comprises disposing at least one meter on the at least one delivery line and measuring a total energy amount delivered to the energy-consuming site via the at least one delivery line.

[c50]   50. The method according to claim 42 further comprising interconnecting each of the means for measuring, the means for determining, the means for transmitting, the means for analyzing and evaluating, the means for generating, and the means for providing.

[c51]   51.The method according to claim 50, wherein the step of interconnecting comprises providing a communication link interconnecting each of the means for measuring, the means for determining, the means for transmitting, the means for analyzing and evaluating, the means for generating, and the means for providing; the communications link being selected from the group consisting of phone modem, network connection, communication, radio communication and other wireless communication systems, cellular communication, satellite communication, web access communication, Internet access communication, Intranet access communication, and combinations thereof.

[c52]   52.The method according to claim 42, wherein the step of analyzing and evaluating the energy amounts consumed and the information comprises processing the energy amounts and the information using at least one data processing module.

[c53]   53.The method according to claim 42, wherein each of the step of measuring the energy amounts consumed at the energy-consuming site and the step of analyzing and evaluating the energy amounts consumed and the information comprises processing the energy amounts using at least one data processing module.

[c54]   54.The method according to claim 42, wherein the step of analyzing and evaluating the energy amounts consumed and the information further comprises providing energy-provider information for evaluation and analysis.

[c55]   55.The method according to claim 54, wherein the step of providing energy-provider information comprises providing real-time energy-provider information.

[c56]   56.The method according to claim 55, wherein the step of providing energy-provider information comprises providing the energy-provider information in electronic form.

[c57]   57.The method according to claim 55, wherein the step of providing energy-provider information comprises providing at least one of energy unit prices, delivery tariffs, energy taxes, and combinations thereof.

[c58]   58.The method according to claim 42, wherein the step of analyzing and evaluating comprises providing energy delivery information for evaluation and analysis.

[c59]   59.The method according to claim 58, wherein the step of providing delivery information comprises providing at least one of delivery routes, delivery costs, loss costs, tariffs, taxes, transportation costs, and combinations thereof.

[c60]   60.The method according to claim 42, the method further comprising the step of providing process variable information for analyzing and evaluating the energy amounts consumed and the information.

[c61]   61.The method according to claim 42, wherein the step of providing process variable information comprises providing at least one of time, date, temperature, humidity, energy-consuming site location, and other process variables for the energy-consuming site.

[c62]   62.The method according to claim 42, the method further comprises the step of providing raw material data for analyzing and evaluating the energy amounts consumed and the information.

[c63]   63.The method according to claim 42, the method further comprises the step of providing by-product and waste information for analyzing and evaluating the energy amounts consumed and the information.

[c64]   64.The method according to claim 42, the method further comprises a step of providing raw material information for analyzing and evaluating the energy amounts consumed and the information.

[c65]   65.The method according to claim 42, wherein the step of analyzing and evaluating the energy amounts consumed and the information further comprises at least one of acquiring data, mining data, and analyzing data.

[c66]   66.The method according to claim 65, wherein the step of acquiring data, mining data, and analyzing data further comprises providing data acquisition software, data mining software, data analysis software, and combinations thereof.

[c67]   67.The method according to claim 42, wherein the step of analyzing and evaluating the energy amounts consumed and the information further comprises developing strategies for purchasing energy, for predicting energy use trends, for planning energy-related decisions, and combinations thereof.

[c68]   68.The method according to claim 42 further comprises communicating the analyzed and evaluated data and information and the predicted required amounts of energy via a web site.

[c69]
         69.The method according to claim 68 further comprises permitting feedback into at least

one of the means for measuring, the means for determining, the means for transmitting, the means for analyzing and evaluating, the means for generating, and the means for providing.

[c70]   70.The method according to claim 68, wherein the step of communicating the analyzed and evaluated data and information and the predicted required amounts of energy via a web site further comprises providing at least one of the analyzed and evaluated data and information and the predicted required amounts of energy in real-time and historical data.

[c71]   71.The method according to claim 68, wherein the step of analyzing and evaluating the energy amounts consumed and the information further comprises using at least one data processing module for analyzing and evaluating, and the method further comprises connecting a web site to said at least one data processing module.

[c72]   72.The method according to claim 42, wherein the predicted amounts of energy required for the operation are outputs of a transfer function that relates amounts of energy consumed to information regarding the operation.

[c73]   73.The method according to claim 72, wherein the transfer function is generated in the step of analyzing and evaluating said amounts and said information.

[c74]   74.The method according to claim 73, wherein the transfer function is a result of a regression of energy consumption on other variables of the energy-consuming site.

[c75]   75.The method according to claim 74, wherein the transfer function is generated automatically from input data by software provided for analyzing and evaluating.